REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested. Claims 1, 3-4, 7-8, and 10-30 are presently active in this case, Claims 2, 5-6 and 9 canceled, and Claims 1, 10-12, 27-28 amended and Claims 29 and 30 added by way of the present amendment.

In the outstanding Office Action, Claims 1, 3-5, 8-10, 13-14, 17-23, 27 and 28 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,057,247 to Imai et al.; Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Imai et al. in view of U.S. Patent No. 6,545,245 to Yeh et al.; Claims 7, 12 and 15-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Imai et al.; Claims 6 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Imai et al. in view of U.S. Patent No. 7,097,716 to Barnes et al.; and Claims 24-26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Imai et al. in view of U.S. Patent No. 5,403,434 to Moslehi.

Turning now to the merits, in order to expedite issuance of a patent in this case, Applicants have amended independent Claims 1, 27 and 28 to clarify the patentable features of the present invention over the cited references. Specifically, Applicants' independent Claim 1, as amended recites a method of removing a fluorocarbon polymer chamber residue from a plasma processing system. The method includes introducing a process gas into a process chamber, the process gas consisting of at least one of carbon monoxide, carbon dioxide, an alcohol, an aldehyde or ketone, or at least one of these molecules in combination with one or more of H_2, NH_2, H_2O, N_2 or an inert gas. Also recited is generating a plasma from the process gas, and exposing the fluorocarbon polymer chamber residue to the plasma in a waferless dry cleaning process to form a volatile reaction product from the residue, wherein a shield wafer is not provided on the substrate holder of the plasma processing

system so that the substrate holder is cleaned by the waferless dry cleaning process. Finally, the claimed method recites exhausting the reaction product from the process chamber.

Thus, Applicants' independent Claim 1 has been amended to clarify that the process gas "consists" of at least one of the molecules listed in paragraph [0032] of Applicants' specification, and further to specify that the method is a waferless dry cleaning method where a shield wafer is not provided on the substrate holder of the plasma processing system so that the substrate holder is cleaned by the waferless dry cleaning process. Independent Claims 27 and 28 have been similarly amended to include these features and system in means plus function claim format. Applicants note that Claims 1, 27 and 28 previously recited that the process gas "includes a gas containing carbon and oxygen," which could be interpreted to include O_2 gas. However, Figures 5 and 7 show a standard argon plus O_2 process as a conventional baseline process to which other processes are compared. Further, curve 6 of Figure 6 shows improved process results with the removal of O_2 at a process chamber pressure of 100 mTorr. As seen in Figure 6, the use of O_2 provides acceptable results only in a process operated at the undesirable higher pressure of 600 mTorr. Thus, while Applicants' specification does not explicitly exclude oxygen from the process gas, the specification shows the benefits of eliminating O_2 from the process gas. Further, paragraph [0032] of Applicants' specification provides a list of preferred process gas molecules, which does not include O_2. Applicants have now amended the independent claims to recite that the process gas consists of this list of preferred molecules that excludes O_2.

In contrast, the cited reference to Imai et al. discloses a method for controlling the environment inside a reaction chamber of a dry etching apparatus. As seen throughout Imai et al., undesirable fluorine is removed from the reaction chamber by generating oxygen plasma in the reaction chamber. In particular, column 19, lines 19-21, recited in the outstanding Office Action, explicitly state that "carbon oxide and oxygen gases are

introduced into the reaction chamber 107 at respective flow rates of 200 sccm or more and 80 sccm or more (in step S305)." Thus, Imai et al. does not disclose that the process gas consists of the gases enumerated in independent Claims 1, 27 and 28 (the list excluding O_2). Thus, these claims patentably define over Imai et al.

In addition, Claim 1 has been amended to recite that the exposing includes a waferless dry cleaning process where a shield wafer is not provided on a substrate holder of a plasma processing system so that the substrate holder is cleaned by the waferless dry cleaning process. As discussed in Applicants' specification, the claimed cleaning process allows improved cleaning of the substrate holder so that particulate contamination will not occur in processed wafers. The Final Action cites column 5, lines 1-14 of the secondary reference to Yeh et al. as teaching this feature (previously included in Claim 2). This portion of Yeh et al. merely mentions the possibility of a waferless chamber conditioning process without any indication that this is advantageous. Further, the primary reference to Imai et al. is primarily directed to cleaning a polymer film from a feature in a substrate (see for example Figures 1a-1d, 5a-5b, 9a-9d, and 24a-24d). Based on this, Applicants respectfully submit that one of ordinary skill in the art would not modify the process of Imai et al. to remove the substrate to perform a waferless dry cleaning process as mentioned in Yeh et al. Moreover, there is no hint in either of Yeh et al. or Imai et al. to perform a waferless dry cleaning process using a gas consisting of the gases now recited in Claims 1, 27 and 28.

The cited references to Barnes et al. and Moslehi are cited for teachings within the dependent claims and do not correct the deficiencies of Imai et al. and Yeh et al. noted above. Therefore, for the reasons discussed above, Applicants' independent Claims 1, 27 and 28 patentably define over the cited references. As the remaining pending claims in this case depend from one of the independent claims distinguished above, these dependent claims also patentably define over the cited references.

Nevertheless, Applicants have added Claims 29 and 30 to further clarify the patentable distinctions of the present invention over the cited references. Specifically, Applicants' Claim 29 specifies that the process gas consists of CO, CO_2 or at least one of these molecules in combination with an inert gas. Claim 30 recites that the process gas consists of pure CO, or CO in combination with Argon. The prior art references do not disclose these features. Further, Applicants' Figures 5-7 show the superior results provided by pure CO or CO in combination with Argon. Thus, Applicants' Claims 29-30 provide additional basis for patentability over the cited references.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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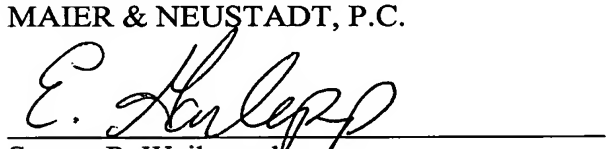

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